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AMENDED SPECIFICATION

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PATENT SPECIFICATION



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COMPLETE SPECIFICATION

Improvements in or relating to Road Surfacing and like Material

We, WILLIAM FRANK REES, a British Subject, of William F. Rees Limited, Public Works Contractors, Cheltenham, Gloucestershire, and WILLIAM F. REES 5 LIMITED, a British Company, Public Works Contractors, Cheltenham, Gloucestershire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly 10 described and ascertained in and by the following statement:—

The present invention relates to road surfacing and like material of the kind which is spread over the road or path- 15 way to be surfaced and, without being heated in any way, is rolled or otherwise subjected to pressure, final compression being left to the action of the traffic.

A road surfacing material of the above 20 kind is prepared by thoroughly incorporating ground rock material, hereafter referred to as the aggregate, with a soft bitumen having a penetration greater than 350, hereafter referred to as the 25 matrix, which liquefies at about freezing point, the proportion of bitumen in the mass being reduced from the normal 11 to 12% by weight to from 4 to 8% where- by the same is just sufficient to form a 30 thin coating on the grains of rock material and render the mass easily compressible, even at low temperatures, without the grains of rock material being rigidly cemented together.

35 The above method of preparing the type of road surfacing material to which the present invention relates is disclosed in Specification 179,166.

40 The present invention is distinguished from that disclosed in Specification 179,166 in that the material is produced from aggregate which has been screened or sieved so as to separate it into two 45 portions, one portion having a particle size such as to be retained by a 20-mesh

sieve, and the other portion having a particle size such as to be capable of passing a 20-mesh sieve, said latter or fine particles being added to the coarser particles by mixing after said coarser particles have been coated with the matrix 50 so as to produce a product in which some of the aggregate remains uncoated.

Before effecting a mixture of the matrix and coarse aggregate, the latter is 55 preferably heated, and the matrix separately heated to bring it into a fairly freely flowing condition. The heated aggregate is then conveniently treated with a small quantity of asphaltic or 60 creosote oil before the heated (i.e. fluid) matrix is run in.

It is to be understood that no broad claim is made to the feature of sieving the aggregate and adding the same in 65 two stages one before mixing with matrix and the other subsequently as such is the normal process of manufacture of cold asphalt.

An aggregate which may be employed 70 according to the invention is one, which is conveniently of limestone or granite, of a particle size known commercially as "1/4th inch to dust." Such an aggregate is screened on a 20-mesh sieve and 75 the relatively coarse and fine particles so separated are employed as the coated and admixed aggregate respectively.

The matrix is constituted by a very soft bitumen, slightly more of which may be 80 used, in order to obtain an improved product, than is necessary to provide a coating for all of the coarse aggregate employed and the bitumen may conveniently be such as to suffer penetration by 85 a 50 gr. load at 25° C. to an extent of 68/32", that is bitumen known commercially as 400 penetration. Such bitumen is to be understood by the phrase "bitumen material of the nature specified" 90

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employed hereinafter in the present specification. The coarse and fine aggregates may then be present in the mixture in approximately equal quantities by weight.

In order that the invention may be more clearly understood a preferred method employed in the preparation of a specific example of granular material provided by the invention will now be described.

According to this example the matrix is constituted by a soft bitumen material of the nature specified and the aggregate is of limestone. The latter material is conveniently obtained commercially of a graded size known as "1/8 inch to dust," and for the purposes of the present method this aggregate is screened or sieved so as to separate it into two portions, one of which has a relatively coarse particle size and the other of which is finer and includes the "dust" portion of the original limestone aggregate. The sieve employed for this separation is one having 20 meshes to the inch (commonly known as a 20-mesh sieve) and the material retained on such a sieve is employed in the first step of the method which is being described.

The coarse aggregate is heated to a temperature of approximately 150° F. in a suitable container and a matrix, which is constituted by a very soft bitumen, is heated separately to a temperature of from 210° to 250° F., at which temperature the bitumen is a substantially freely flowing material. The heated aggregate is then treated with a small quantity of asphaltic or creosote oil, conveniently employed to an extent of from 1 or 2 lbs. for treating about one half of a ton of coarse aggregate. The heated (i.e. fluid) bitumen is then run into a mixing machine containing the treated coarse aggregate and a thorough mixture of these materials prepared. The quantity of bitumen employed in this mixing is, in the present method, approximately 6% by weight of the quantity of total (coarse and fine) aggregate employed. The mixing can be carried out in any form of mixer, a simple form of apparatus found to be quite suitable having two separately mounted paddles rotating through that part of the mixer which contains the materials to be mixed.

To the mixed product a quantity of the fine aggregate is added and this second addition of aggregate is also well mixed into the product of the first mixing. The fine aggregate is added without itself first being heated, and in the present example is preferably added in a quantity, measured by weight, approximately equal

to that quantity of coarse aggregate employed.

The result of the first mixing process is to coat the particles of the coarse aggregate with the matrix and the addition of the finer aggregate then produces a very free granular mixed product in which some of the aggregate remains uncoated. The final product is a granular material which can be stored in considerable quantities without the formation of non-disintegrable masses or lumps during storage. In use the material according to the invention is spread over the road or pathway to be surfaced and, without being heated in any way, it may be rolled or otherwise subjected to pressure, and by this means the granular material settles down and is compressed into a continuous solid waterproof layer or surface. The roadway, to be surfaced may, if desired, be conveniently coated with a binding material before the surface of the material according to the invention is applied.

Throughout the specification the term "matrix" is to be understood as referring to a material having a penetration greater than 350 which is semi-solid at ordinary temperatures and includes such materials as bitumen, tar, resinous and asphaltic materials (which latter may be naturally occurring materials) and residues from various petroleum or rosin distillation processes. Similarly the term "aggregate" is to be understood as referring to a quantity of mineral material, slag or clinker, broken up if necessary so as to form a more or less granular material.

It is to be understood that material according to the invention may be prepared from a mixed aggregate, that is consisting of two or more of the substances referred to as included by this term and furthermore the matrix also may comprise a mixture of two or more of the substances such as bitumen and tar referred to in the opening passages of the specification.

It is to be understood further that the material according to the invention can in some cases also be used for purposes for which bitumen and asphalt have hitherto been used as for example surfacing roofs, walls and floors and as a damp course in a light structure, in addition to the surfacing of roadways, paths and like already referred to.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Road surfacing or like material of the type specified which is produced from

aggregate which has been screened or sieved so as to separate it into two portions, one portion having a particle size such as to be retained by a 20-mesh sieve, 5 and the other portion having a particle size such as to be capable of passing a 20-mesh sieve, said latter or fine particles being added to the coarser particles by mixing after said coarser particles have 10 been coated with the matrix, so as to produce a product in which some of the aggregate remains uncoated.

2. A process as claimed in claim 1 in which the coarse aggregate is first heated 15 and treated with a small quantity of asphaltic or creosote oil before being mixed with the matrix.

3. A process as claimed in either of claims 1 or 2 in which the coarse aggregate is heated to a temperature of 20 approximately 150° F. and the matrix separately heated to a temperature of

from 210 to 250° F. and in which the heated matrix is run into a mixing machine in which the heated coarse 25 aggregate is placed.

4. A process as claimed in claim 3 in which the second fine aggregate is added to the mixed product without itself first 30 being heated.

5. A process as claimed in any of the preceding claims in which the coarse and fine aggregates are employed in approximately equal quantities by weight.

6. Processes of preparing granular 35 road materials substantially as described.

7. Granular road materials when produced by any of the processes claimed in claims 2 to 6.

Dated this 11th day of July, 1934.

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